

December 20, 1985

Mr. Donald E. Park
Corporate Director of Environmental Affairs
Ethyl Corporation
P. O. Box 341
Baton Rouge, Louisiana 70821

Project No. 5001

Revised Ground Water Testing Program
Tank Area
Ethyl Edwin Cooper Plant
Sauget, Illinois

Dear Mr. Park:

International Technology (IT) Corporation submits herein a revised ground water testing program for the Ethyl Petroleum Additives Division (Ethyl), Sauget, Illinois plant. Our ground water testing program includes location, design, drilling, well installation and sampling procedures, and completion documentation. The program is based upon our review of pertinent data related to the site, experience with similar situations and the plant site, and recent EPA comments received November 22.

Location

Recent conversations with nearby facilities indicates that ground water flow is away from the nearby river during high river stages, and toward the river at low river stages. Flow rates in the water bearing formation are verbally reported to range from 0.5 to 1.0 foot per day. Such flow rates indicate that contaminants, if present, will be detectable at monitor wells located adjacent to the spill area and that wells do not have to be drilled directly through the spill area.

The following revised well locations have been developed in accordance with the recent EPA comments. Figure 1 shows our recommended locations.

The objective of the ground water testing program is to obtain samples of ground water immediately adjacent to Unit 268 and the nearby Black Tanks to determine the presence, if any, of tetrachlorodibenzo-p-dioxin (TCDD) in ground water. In order to achieve this objective, we propose to place two wells upgradient and two wells downgradient from the Black Tank Area and Unit 268 area as shown on Figure 1.

The location of these wells are consistent with our initial submittal and the review comments provided in a letter to Ethyl from the EPA. We believe that the relatively high rate of ground water velocity and concerns related to surficial dioxin contaminants will be sufficiently addressed by the installation of the four monitoring wells at the proposed location. Note that all well locations are planned to be outside the diked area which may have contained spills of materials containing TCDD. This will minimize problems of:

- o Worker safety,
- o Down-hole contamination, and
- o Disposal of drill cuttings.

The wells will still be close enough to the potential sources of contamination to define subsurface ground water contamination, if any.

Design

The well design is shown on Figure 2 and consists of a sump, screen, riser pipe, cap, sand or gravel pack, bentonite seal, grout, locking cap and protective posts. The length of casing and depth of the well is planned so that the screened interval will be submerged during low ground water conditions. The purpose of the sump is to collect any soil/sediments which may enter the well through the gravel pack and slotted screen. The sump will extend two to five feet. Based on our considerable experience in monitor well design, installation and operation, we believe a sump is an important maintenance item and will extend the operational life of the monitor well. The slots in the screen should be 0.015 inches. The sand will be rated clean sand per ASTM designation A139 and should contain less than five (5) percent weight calcareous (CaCO_3) material. The well diameter will be two (2) inches and the construction material will be polyvinyl chloride (PVC) pipe with flush screw threaded joints. In order to avoid any potential concern for ground water stagnation in the well, we have increased the volume of water to be purged prior to sampling from three well volumes to five.

Drilling Procedure

The drilling crew will use Level C protective clothing during drilling which includes impermeable coveralls, gloves, boots, eye protection and hard hat. A respirator will be carried by each worker and any additional protective measures required by the plant in the non-dioxin

contaminated areas. If any odors or unusual conditions are noted during drilling operations, work will be halted and the plant Health and Safety Officer will be contacted.

The borehole will be advanced by continuously pushing Shelby tube or split-spoon samplers until the ground water table is encountered. The onsite field engineer/geologist will classify the extruded soil samples. Soil samples from critical horizons will be retained for moisture content, grain size, Atterberg limits and permeability testing.

It is anticipated that the drilling will occur during the winter season which may result in a low ground water elevation. Thus, the depth at which the ground water table is encountered will serve as the approximate top of the 5 foot screened interval. After the ground water table is encountered, the borehole will be reamed to ten inches in diameter using standard rotary wash drilling methods. A six inch diameter PVC casing will be placed in the borehole and cemented in place using a cement/bentonite mix. Centralizers or approved equivalent will be used to determine that the casing is placed in the approximate center of the borehole. The grout will be introduced using the tremie method to assure returns to the ground surface and allowed to cure overnight. The hole will then be flushed of all drilling fluid and the drill rig steam cleaned prior to advancing the hole below the water table.

Well Installation

The hole will then be advanced approximately thirteen (13) feet below the protective casing, with sampling and rotary wash. The well, with centralizers, will be installed as shown in Figure 2 followed by the gravel pack and a two foot bentonite seal. The remainder of the annular space will be sealed using a cement/bentonite grout.

After the grout is allowed to cure the well will be purged of well drilling fluids by flushing with air and/or clean (potable) water. The well will be tested for performance by completing a well sensitivity test. This test will also provide an estimate of the hydraulic conductivity of the formation.

Subsequent to drilling, protective posts and the locking cap will be placed on the well. The location of the well will be surveyed to ± 1.0 feet. The vertical elevation will be surveyed to ± 0.05 feet.

Ground Water Sampling

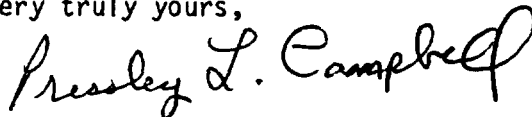
At least one week after the well ground water elevation has stabilized, following development and sensitivity testing, the monitoring wells will be purged and sampled. The wells will be purged of five well volumes to remove any stagnant water. The well will be sampled using a dedicated PVC bailer. Samples will be placed in one liter glass containers, (with Teflon-lined cap), placed on ice, and shipped to the IT or contract laboratory. One duplicate, sample and one field blank will be included. Sample labels, chain-of-custody, and sample collection forms will be completed.

Completion Documentation

After well construction and sampling IT will provide a Well Completion Documentation Report. The report will include Field Activity Daily Logs, Boring Logs, Well Completion Diagrams, Sensitivity Test Results, Ground Water Flow Calculations and Sampling Documentation. If IT performs the sample analyses, the Laboratory Analytical Report will be included as well as an evaluation of the extent of any contamination.

IT Corporation appreciates the opportunity to provide this scope for a ground water testing program to Ethyl. We look forward to assisting you further. If you have any questions, please do not hesitate to contact me.

Very truly yours,



Pressley L. Campbell, Ph.D., P.E.
Regional Technical Manager

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NUMBER

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DATE

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APPROVED BY

A.B.L.
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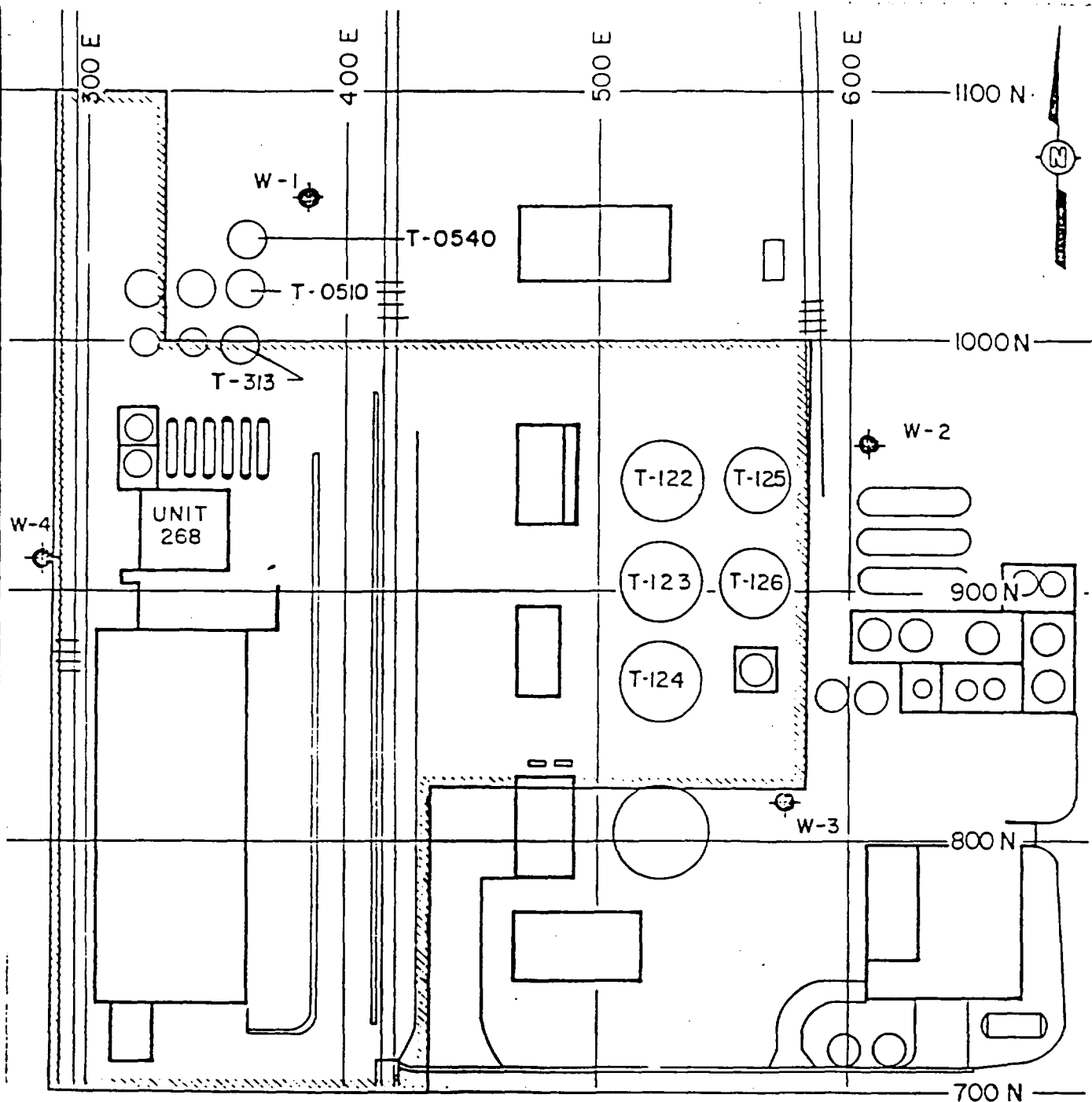


FIGURE 1

PROPOSED WELL LOCATIONS

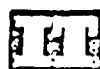
LEGEND

AREA OF KNOWN SURFICIAL DIOXIN CONTAMINATION

— SYMBOL FOR PROPOSED WELL LOCATION (POSITION APPROXIMATE)

PREPARED FOR

ETHYL PETROLEUM
ADDITIVES DIVISION
SAUGET, ILLINOIS



DRAWN BY
 KEEL
 12/85
 CHECKED BY
 8/11
 APPROVED BY
 2/20
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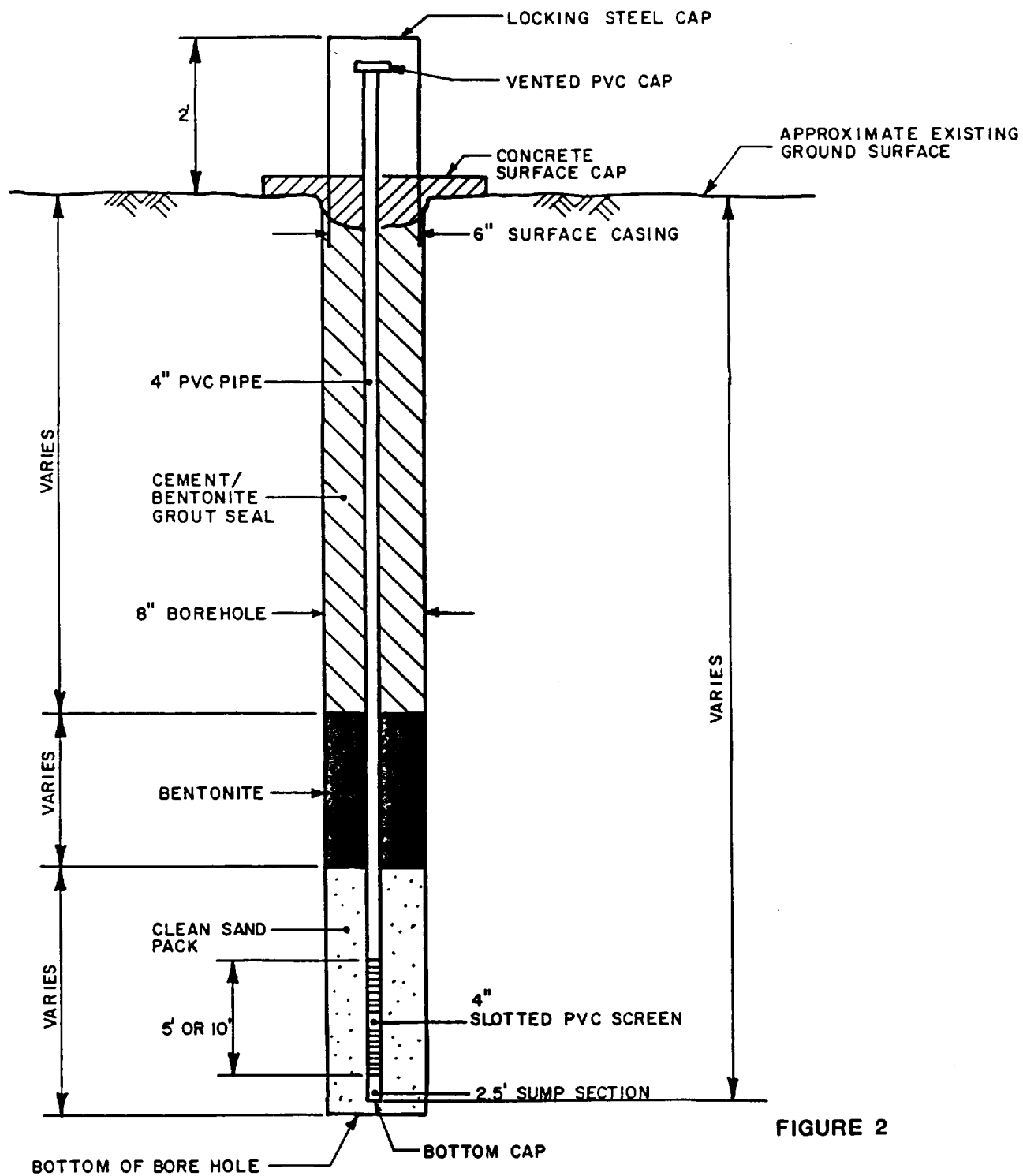


FIGURE 2

TYPICAL MONITOR WELL

PREPARED FOR

ETHYL CORPORATION
 BATON ROUGE, LOUISIANA

NOTE :
 SCREEN DEPTH OF EACH MONITOR WELL
 AND ACTUAL WELL CONSTRUCTION
 DIMENSIONS WILL BE DETERMINED
 IN THE FIELD.

